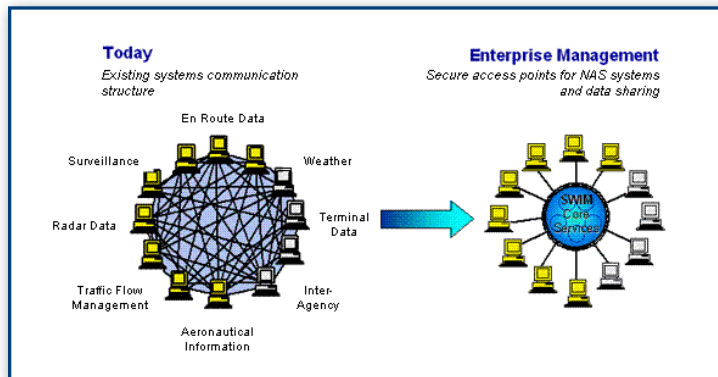


## SWIM Enables Data Sharing



By Ahmad Usmani

The System Wide Information Management (SWIM) Program is an integral part of the National Airspace System (NAS) Enterprise Architecture Roadmap. SWIM will close existing performance gaps by developing a set of NAS services based on common standards and tools, using a Service-Oriented Architecture (SOA). Program policies and standards will also be provided to support data management, along with some commercial software to support the core services needed to publish data, retrieve it, secure its integrity, and control its access and use.

SWIM will leverage existing systems and networks to the extent practicable, and will be based on technologies that have been proven in both operational and demonstration environments to reduce cost and risk. Additionally, SWIM will be developed incrementally based upon the needs of various data communities, as well as maturity of concepts of use in segments that are sized to fit reasonable cost, schedule, and risk thresholds. ➔

## What is SWIM-Compliant?

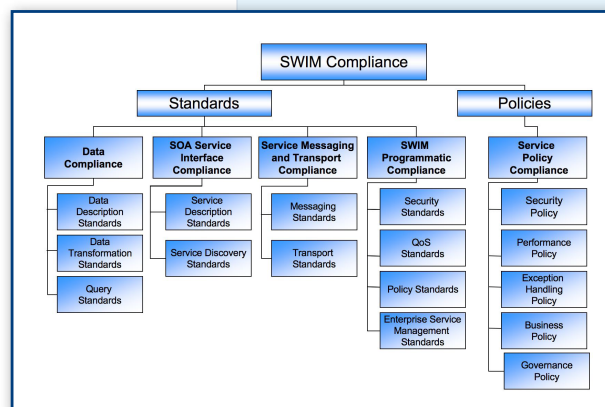
By Jim Robb

SWIM provides the basis for information exchange between systems. For applications and systems to be accessible and interoperable via SWIM services, it is necessary for these applications and systems to be SWIM-compliant. This requires common understanding of and definitions for SWIM compliance, compliance boundaries and associated standards/policies.

SWIM compliance includes standards and policy categories. Four types of standards-related compliance components are categorized as Data Compliance, SOA Service Interface Compliance, Service Messaging and Transport Compliance, and SWIM Programmatic Compliance.

Compliance. Policy category includes Service Policy Compliance component. Specific standards and/or policies are associated with each of these compliance classes. The taxonomy of SWIM compliance is presented in the figure.

The SWIM Requirements and Governance team continues to work compliance issues, associated standards and policies, compliance classes due to the incremental development of SWIM and the varying needs of SWIM services from different NAS applications/systems. ➔



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IONA representative Robert Kilker and the SWIM PM.

## SWIM Awards Service Container Contract

By Jeffery Hobbs and Anne Wells

The FAA Washington Headquarters office awarded Contract DTFWA-08-C-00111 to IONA Technologies of Waltham, MA on August 18 for Service Container Software to be used in the System Wide Information Management (SWIM) program. This contract will provide for commercially available software necessary to implement SWIM Segment 1 services.

The SWIM use of service-oriented architecture (SOA) technology allows software applications in the National Airspace System (NAS) to locate and interact with one another through information services that can be accessed without knowledge of an application's underlying platform implementation. This simplifies interface requirements of existing NAS systems and ensures that new systems can be built with minimum technology constraints (hardware, software, and data definition). Thus, NAS development and implementation costs and risks for new applications will be lower. This acquisition is acquiring software, support, and training for use by FAA SWIM Implementing Programs (SIPs).

SWIM executed its first contract modification on October 17. This secured production licenses for the SWIM laboratory and training for the team. Training commenced October 20. ➔

## What is a Service Container?

By Ed Ost

A service container is an infrastructure artifact that provides necessary Information Technology (IT) functional support, as well as hosting capabilities. SWIM uses the service container as the means for achieving consistency and interoperability among diverse NAS programs and operating elements in the absence of a centralized service infrastructure.

SWIM Segment 1 identifies standardization focused on interoperability and interface management. The FAA will use a federated approach, making standardization necessary at all levels. A service container is consistent with the federated approach for SWIM Core Services implementation used in Segment 1.

**The service container is a logical component of the architecture that supports SWIM Core Service functionality.** It serves as the point of enforcement

for enterprise-wide policies. SWIM messaging is mediated through the service container, which acts as a demarcation point between the SWIM Implementing Program (SIP) systems and the SWIM infrastructure. The service container will decouple supporting enterprise IT technologies such as security, messaging, directory services, and system management, as well as a newer SOA-oriented registry. By itself, the service container does not constitute an Enterprise Service Bus (ESB) because it does not supply the reliable messaging or security features typically associated with an ESB. However, augmented by other enterprise IT, the service container can be part of an ESB solution. Individual NAS systems using the service container approach benefit from pluggable enterprise IT elements that can be incrementally migrated in future SWIM standardization and consolidation phases.

A service container approach will also accelerate service implementation by providing standard, reusable, common infrastructure elements. It provides access to enterprise resources and simplifies the service design and development process. Use of a service container encourages consistent use of common capabilities.

Lightweight service containers have much less impact on legacy systems than heavyweight containers. Lightweight, non-invasive, portable containers can be deployed easily. SIP architects have the maximum freedom in shaping their solutions to meet the individual constraints of their systems. In addition this allows the service container to act as the universal policy enforcement point for all IT aspects. In contrast to the standards only based approach, the service container provides the necessary architectural consistency to achieve enterprise management and control.

The service container is highly portable, non-invasive, and lightweight; it can transform simple service implementations into smart endpoints that are easily managed, extended, and composed. Portability allows programs to deploy and manage the service container within their existing environments consistent with the federated approach of SWIM Segment 1. ➔

## UPS First in the Pool for a SWIM

By Jon Henning

October 16 - United Parcel Service (UPS) is the first airline to receive digital weather information from the FAA under Next Generation Air Transportation System (NextGen's) transformational System Wide Information Management (SWIM) program – bringing the goal of giving all users a common picture of the national airspace system (NAS) a step closer.

On October 6, UPS started receiving SWIM-compliant data via the Integrated Terminal Weather System (ITWS) Prototype Service. SWIM, a cornerstone of the NextGen, provides common and secure information across a digital network to all NAS users. It provides the technology and IT standards to NAS programs so that weather and other air traffic information can be more easily shared with other parts of the aviation community, including the airlines, the Department of Homeland Security (DHS), and Department of Defense (DoD). This data-sharing improves common situational awareness among all NAS users.

In a major SWIM milestone, UPS now gets SWIM-compliant digital data for four ITWS weather products: the Microburst TRACON Map; the Gust Front TRACON Map; Terminal Weather Text; and Configured Alerts.

UPS "can now get data more easily," said SWIM Implementation Team Lead Jeffery Hobbs, who noted that one of SWIM's goals is to make data more accessible.

"SWIM gives us common situational awareness," added Hobbs. "We want a dispatcher to see the same weather information as the controller."

UPS receives the SWIM-enabled weather products by connecting to the FAA Telecommunications Infrastructure external gateway at the William J. Hughes Technical Center (WJHTC) in Atlantic City, N.J.

Hobbs stressed that the data is securely delivered – another benefit of SWIM through the use of the FAA Telecommunications Infrastructure (FTI) external gateway. An advantage of SWIM over current information dissemination is that it is digital. Graphical information is passed onto users instead of voice or static paper information.

Currently, data that the FAA provides cannot be directly integrated with a user's own system. However, the digitally formatted data provided by SWIM can be integrated with a user's displays and maps. SWIM prescribes to industry standards to format and transmit data, allowing NAS information to be readily shared, creating a common picture of the system for all users, Hobbs explained.

While UPS is the first airline to receive this data, the FAA plans to add additional users in the coming year.

More SWIM program information is available at [www.swim.gov](http://www.swim.gov). ➔

## ITWS Prototype Service Extended to Airlines

By Anne Wells

On June 20 the FAA released criteria to industry users who are interested in participating in an Integrated Terminal Weather System (ITWS) Prototype Service. They will examine the feasibility of distributing real-time ITWS digital weather data in an industry-standard data format (XML) using a Service Oriented Architecture (SOA)-compliant Web Services interface.

The ITWS Prototype goal is to deliver ITWS data, using Virtual Private Network (VPN) technology. The ability to distribute this data over the Internet was made available in September 2008.

The SWIM/ITWS Prototype Service will initially offer four products:

- Microburst
- Gust Front
- Configured Alerts (Ribbon Display)
- Terminal Text

When additional products are ready for deployment (as part of SWIM Segment 1 development), they will be made available through the Prototype Service. This will give prototype users an early look at new products as they become available, and will give the SWIM development team valuable feedback on the content and formatting of the products.

The ITWS Prototype Service began in September 2008 and will run until the entire suite of ITWS digital data products is made available as part of the SWIM Segment 1 deployment. Deployment is currently scheduled for 2<sup>nd</sup> quarter 2011.

The FAA SWIM Program Office has selected JetBlue Airways, Northwest Airlines and United Parcel Service (UPS) as initial participants. Other applications will be considered for participation in the future.

Industry feedback and lessons learned (LL) will be applied to the SWIM Segment 1 implementation. ➔



## CIWS Prototypes Service Container Product Demonstrated

By Anne Wells

SWIM conducted a prototyping effort to investigate service oriented architecture products in the context of real-world service deployments.

The Mule service container is an open source software product that was used to implement data access services for the Corridor Integrated Weather System (CIWS) products.

Mule bundles together a large number of open-source technologies and provides additional glue code to allow them to be tied together effectively. However, the product has more of an integration focus, while the service container requirements most relevant to the CIWS system involve exposing CIWS data products using Web service. The Mule container was viewed as being a heavyweight solution for this application. A number of independent technologies were incorporated into the prototype, including the Spring framework and the Apache ActiveMQ messaging solution. These technologies were successfully used during the course of this evaluation to add security and monitoring to prototype CIWS data access services. They are recommended for inclusion in the service container selected by the SWIM program.

The final report will be made available on [www.swim.gov](http://www.swim.gov). ➔

## Topia Demonstrates MOT

By Greg Snead

On August 5 Topia Technology, Inc. demonstrated the integration of Kolona™ mobile object technology (MOT) with both the IONA Fuse ServiceMix and Mule service containers.

The prototype application is based on Kolona MOT and allows Topia engineers to introduce new message-flow monitoring capability into the service container environment.

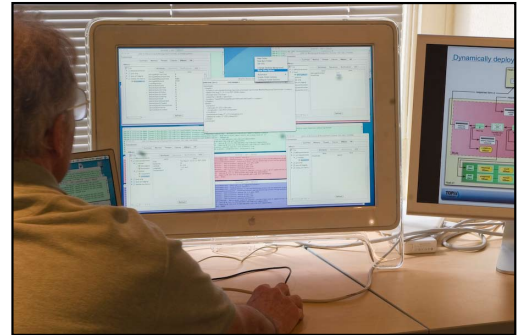
Topia demonstrated how new functionality can be introduced at runtime and from a central location to the distributed service containers without the manual steps and restart required for conventional system change.

By evolving the service container environment in a non-disruptive fashion, the prototype seeks to illustrate how Kolona MOT increases the opportunities for more sophisticated, adaptive monitoring capabilities, thereby addressing known system administration needs.

Topia has identified other potential applications of Kolona MOT to meet SWIM requirements, including auditing, fault-handling, dynamic routing, policy management, dynamic orchestration via mediation, and lightweight orchestration as a service.

The prototype was presented to members of the SWIM Program Office as part of a continuing contract to research the applicability of Kolona MOT to SWIM. This prototype was developed in Topia's engineering laboratory in Tacoma, WA.

*Topia's ongoing prototype efforts within SWIM will focus on the weather domain; their next demonstration is scheduled for November 19, 2008 at the WJHTC. ➔*



## SWIM Collaborates With GEIA - Now ITAA

By Mike Shveda

The System-Wide Information Management (SWIM) Program supports a policy of open communication with SWIM stakeholders to keep them informed on and participate in the program's progress. SWIM has successfully established a robust and fruitful relationship with the Information Technology Association of America (ITAA), formerly the Government Electronics and Information Technology Association (GEIA). SWIM has utilized the GEIA Air Traffic Control Committee since July 2007 to improve the quality of work products and ensure a truly open solution.

The GEIA collaboration has produced several valuable documents. The first was an excellent strategy paper on SWIM service-oriented architecture (SOA) based on SOA industry best practices. Another insightful paper, titled "FAA SWIM Program SOA Governance Best Practices - Industry Input", was produced in 2008.

Currently SWIM is in the process of defining our second segment capabilities (Segment 2). Again we are collaborating with GEIA to develop Segment 2 architectural recommendations based on the earlier GEIA SOA industry best practices paper to gain industry perspective on how to best evolve the SWIM Program from Segment 1 to 2. ➔

# SWIM Holds TIM 2

Prototype Demonstrations Technical  
Interchange Meeting (TIM)

By Mike Hritz and Eric Helfers

September 24 - SWIM Team Leaders met with the leaders and representatives of over 10 FAA, Industry Teams, and Department of Defense (DoD) demonstrations. The purpose was to present the latest information on SWIM and provide an understanding of net centric related demos.

The first meeting had been held in March. After introductory remarks by Ahmad Usmani, SWIM Program Manager, SWIM team leads provided details about the recent selection of the Service Container (Iona Fuse) and its basic capabilities, SWIM WJHTC labs tasks, and how the ITWS Prototype may be used. Next for discussion was the SWIM Governance Model and implementation plans as well as Standards and Registry information.

Following the SWIM updates, the managers and representatives interested in SWIM progress and capabilities explained their demo concepts.

These were the Daytona Integrated Test Facility, International Flight Data Object, Net Centric Operations (NEO), Atlantic Interoperability to Reduce Emissions (AIRE including Surface, Arrival – Trajectory Based Operations and Continuous Descent Approach, and Oceanic), FTI Enhanced Data Service – X (ED-X), and the Hanscom directed Joint Field Exercises (JEFX provided by the lead MITRE PM). The SWIM Alliance Integrated Labs presentation concluded the discussion. All expressed interest in following SWIM guidelines for future interoperability.

The technical data exchange provided some unexpected benefits. Side coordination meetings among demo reps that were not aware of the specifics of each others demos will lead to future information sharing and possible mutual data access.

The meeting minutes and presentations are posted on the SWIM website at [www.swim.gov](http://www.swim.gov). A third technical exchange is tentatively planned for February 2009.

All of these efforts are being led by SWIM Evolution and Coordination lead, Mike Hirtz. ➔

## SWIM FAA Standard

By Jim Robb

SWIM is participating in the Service Registration Working Group. The group is developing a series of standards for use by the FAA and contractors involved in the development of Extensible Markup Language (XML) based artifacts, web services, and web services-related architectures.

The first three standards deal with XML Namespaces, Service Registration, and Service Specification. The namespace standard sets requirements for creating and establishing FAA namespaces used in XML documents, such as but not limited to XML schemas, XML instances, Web Service Description Language (WSDL) documents, and Business Process Expression Language (BPEL) documents. The service registration standard contains the requirements for registering services, including web services. The web service specification standard specifies the minimum acceptable content for documenting services within the FAA. It provides a common reference model for defining and describing FAA services to information technology (IT) service providers, consumers, developers, and managers. It promotes the visibility of services, allowing entities with needs to meet with entities that have capabilities that meet those needs.

The namespace standard is in FAA Data Governance Board coordination. The service registration is in final review by the working group and the service specification standard is in the initial review cycle of the group. These standards will aid in the documentation, discovery, and implementation of services across the FAA. Jim Robb, the SWIM Requirements and Governance Lead is leading this initiative. ➔

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# Wiki Wiki\* bus of the Honolulu Intl Airport



The inventor of the Wiki coined its name after seeing the WikiWiki bus during a visit to Hawaii. \*Wiki is the Hawaiian word for quick.

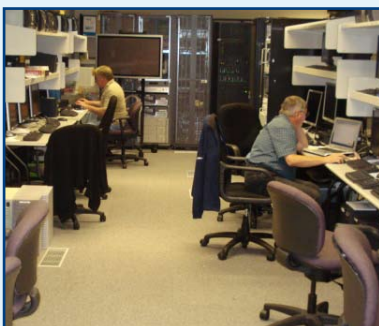
Image use permission granted by the creator Andrew Laing under CC-BY-SA-2.0 .



# SWIM Laboratory Ready to Support Testing



SWIM Prototyping and Support Facility



SWIM Integration Facility

## SWIM Laboratory Objectives:

- Conduct the SWIM support activities. This includes hardware, software, staffing, and network environments.
- Provide an environment for the SIPs to work early in their design phase and development cycle in order to verify how the selected SWIM product(s), SWIM guidance/policies, and SWIM recommended components integrate with the existing systems of a SIP and support the planned SWIM capabilities.

By Mike Shveda

The System Wide Information Management (SWIM) program is fostering the implementation of a net-centric environment with technologies and industry standards that are new in the NAS environment. To support this work, the SWIM program has established a laboratory environment configured to provide an early opportunity to explore, quantify, validate, and define: requirements, standards, policies, performance parameters, and interoperability.

The SWIM laboratory is the product of the integration of two facilities and is located at the William J. Hughes Technical Center (WJHTC) in Atlantic City, NJ. The SWIM laboratory consists of the SWIM Prototyping and Support Facility and SWIM Integration Facility. The two facilities are integrated via a common network.

**The SWIM Prototyping and Support Facility** contains the hardware and software necessary to support the SWIM prototyping, evaluation activities, and trade studies. The selected SWIM Service Container will reside in this facility. The SWIM development Policy Server and design-time Registry will also be hosted here.

**The SWIM Integration Facility** configuration will evolve over the course of FY09. Released versions of the service container software and associated products will be maintained in the SWIM COTS product repository here. The evolution of this facility configuration to support SWIM Implementing

Programs (SIPs) design and integration is currently being defined along with the SWIM Resource Kit and Reference Model.

*The SWIM laboratory provides the necessary environment for conducting SWIM support activities as well as supporting the SIPs design and integration.*

It is controlled by the SWIM Program Office and is under the direction of Jeffery Hobbs, Implementation Lead.

Bud Timoteo is the SWIM laboratory point of contact located at the FAA WJHTC. Any requests for further information on the SWIM laboratory or access to its facilities should be directed to [Dominic.Timoteo@faa.gov](mailto:Dominic.Timoteo@faa.gov). ➔

# SWIM Best Practices Established

By Andy Fleming

In 2005 the Government Accountability Office (GAO) placed the FAA on the high-risk list because they concluded that FAA could do more to institutionalize a system management process improvement initiative. Accordingly, the FAA Administrator established a goal to remove the FAA from the GAO high-risk list. To achieve this objective, an ATO Best Practices Evaluation Program was established that can be tailored by all the NAS modernization programs.

SWIM was asked to assess the program's performance in six best practices processes: quality assurance, measurement and analysis, risk management, requirements, program management, and contract management.

The verification process will be reviewed at a later date upon completion of a verification and validation template. Each template identifies the applicable steps in the Best Practice process; since November 2007, each Team has reviewed these steps and identified the necessary actions to close the found gaps.

As a result, SWIM began the process of reviewing all management plans to determine if they were consistent with the current processes being conducted by the team as well as with the best practices steps in the templates. In addition, upon completion of each of the management plans, an intensive document review was conducted to identify the artifacts established by each plan. This review checked to see if the artifacts were created and maintained in the location cited by the applicable plan. ➔

## SWIM Summer Interns Provide Needed Support



**JoAnne Key** receives SWIM Achievement Award at a Program Office luncheon.



"The federal government would do well to encourage workplace environments as dynamic as SWIM's," stated **Tony Hu**.

JoAnne Key interned at the FAA during the summer of 2008. She is from Norwich, CT and is pursuing her Master of Business Administration at Howard University. JoAnne assisted in the acquisition of service container software and conducted a market survey on mobile object technology for the SWIM program office. In early August, she traveled to Seattle, Washington for a FAA program management review with Topia Technologies.

Tony Hu interned at the FAA during the summer of 2008. He is from Irvine, CA and is pursuing an undergraduate degree in Economics with a minor in Computer Science at Princeton. Tony was assigned to the SWIM program office. After conducting a market survey and recommending a Wiki product for SWIM, Tony helped set up and configure the Wiki at the FAA Technical Center. He returned to Princeton as a junior in September. ➔

## SWIM Team Goals



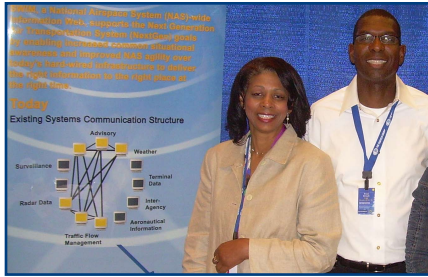
### FY08 Goals

- ✓ Assess performance in 6 Best Practices by December 15, 2007.
- ✓ Complete gap closure planning for 3 Best Practices by February 15, 2008.
- ✓ Complete gap closure planning for 3 additional Best Practices by March 15, 2008.
- ✓ Incorporate Communities of Interest requirements into SWIM Segment 1 Final Program Requirements document by March 31, 2008.
- ✓ Complete SWIM Service Specification Document by July 31, 2008.
- ✓ Define SWIM Core Services IRD by September 30, 2008.

### FY09 Goals

- ◆ Conduct Core Services Software Component Selection due January 31, 2009.
- ◆ Define requirements for Segment 1: Aeronautical Information Management (AIM) portion of the Special Use Airspace (SUA) capability. Due July 31, 2009.





**Rhonda Thomas**, SWIM Acquisition Lead  
**Fred Dendy**, FAA Small Business Office

## SWIM Supports FAA Small Business Initiatives

SWIM participates in the Annual National Small Business Procurement Opportunities Training Conference and Trade Show

**By Rhonda Thomas**

The Annual FAA 2008 National Small Business Procurement Opportunities Training Conference and Trade Show was held June 16-19 in Las Vegas.

The conference provided a forum for small businesses (including service-disabled veteran-owned small businesses and 8a certified firms) to participate in technical and procurement opportunity workshops. Conference sessions linked small businesses with program managers, addressed business issues and concerns, and provided information for small businesses seeking to do business with FAA.

SWIM was briefed and businesses were given the opportunity to meet with FAA representatives.

SWIM is proud of its commitment to the agency's small business initiatives and has established small business contracts with B3 Solutions, LLC (8a, service-disabled and minority owned); Business Support Services (served disabled and minority owned); JMA Solutions (award pending) (8a, woman-owned, service-disabled and minority-owned); and Ictech (8a, minority-owned, HUBZone). Subcontracting arrangements currently exist (or existed this year) for small businesses: Flatirons, Agilepath and North Star Group. Astornet (8a and minority owned) was also awarded a technical services contract in 2007. The 2009 conference will be held on July 20-23 in Atlantic City, New Jersey. ➔

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SWIM Program Office Only.**

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## SWIM Team Member Spotlight



Ahmad Usmani, SWIM Program Manager

By JoAnne Key

Ahmad Usmani is the Program Manager for the SWIM Program Office at the FAA. He assumed the position in Fall 2007. He has bachelor's degrees in Computer Science and Applied Math from Northwestern University and a Master's degree in Industrial Engineering from UC Berkeley.

Before working for the FAA, Ahmad wrote code and worked on the Advanced Automation System for IBM. Ahmad eventually left IBM to work for government contracting companies on programs such as the Voice Switching and Control System (VSCS) for the FAA. Ahmad supported other government agencies before becoming a FAA federal employee in 2002, as a systems engineer and investment analyst for the Traffic Flow Management (TFM) program office.

Ahmad transferred to the SWIM Program Office in 2006 to work on the Segment 1 Final Investment Decision. For SWIM, Ahmad would like to see the newly acquired service container software help in the development of an ITWS Prototype Service—a task recently accomplished.

Ahmad enjoys Chicago stuffed spinach pizza and reading. He has a passion for cars and currently owns a 1979 Triumph Spitfire, among others. Early this year, Ahmad traveled to Montreal for the Canadian Grand Prix. He flew to France this October for the Paris Auto Show. ➔



SWIM Offsite photo, September 17. Not all team members present.  
Front to Back, Jim Robb, Rodney Thomas, Andy Fleming, Mike Hritz, Ahmad Usmani, Rhonda Thomas, Deborah Young, Susan Barton, Josh Hung, Sam Trotman, Brad Fordham, Mike Shveda, Cliff Baldwin, Keith Mangino, and Al Sipes.

## SWIM Team Leads

### Implementation

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[Rhonda.Thomas@faa.gov](mailto:Rhonda.Thomas@faa.gov)

### Program Control

Deborah Young  
[Deborah.Young@faa.gov](mailto:Deborah.Young@faa.gov)

## SWIM Lab Teams



Dominic Timoteo, Mary Delemarre, John Neely, Edmund Makuch, Paul Caron Tri Nguyen



1st Row: Ed Ost, Raju Vemulamanda, Ruben Bigio, Matt Wilson, Perry Rastogi, Rich Deutsch, Kelly Mesveskas

2nd Row: Joe Wiener, Dom Ali, Josh Sigal, Stan Fink, Steve Chappell

SWIM Newsletter provided to you courtesy of the following: Rhonda Thomas, Sue Jones, Deborah Hemphill, Emily Smith and the SWIM Team.

The SWIM Wiki URL is: <https://swimwiki.tc.faa.gov>.

All documents are available to the public on the SWIM external website at [www.swim.gov](http://www.swim.gov).  
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